

14-3-55

18 MAR 1955

Dr. K. S. Krishnan

Director of the
National Physical Laboratory

Dear Dr. Krishnan:

As you know, I have arrived at the conclusion on a basis of my theory that the properties, such as densities and other, must change discontinuously with temperature. Places where the breakage of continuity takes place, I call the "Kinks", which is the corruption of the German word Knick appropriately used for describing such phenomena.

These kinks are particularly well pronounced in the curves for latent heats of vaporization, as seen from figures which existed already 50 years ago. I then showed in 1925 that the the densities are discontinuous as well. I see it quite distinctly by using figures of Sydney Young for 30 liquids (Ramsay's figures are nearly identical).

This work of mine, published in 1924 in Zeit. Phys. Chem. and more fully in the Phil. Mag. 1925, did not convince anybody. It was said: it is shown using figures of only one author.

Since then several authors in the Natl. Bureau of Standards made an accurate work on water. Lately there were three teams working in America on steam. One of them was headed by Prof. F. G. Keyes of Massachusetts Institute of Technology (M.I.T). They all show the same effects.

On Oct. 22, 1954. Prof. F. G. Keyes wrote me: The vapor pressure values corrected to the thermodynamic scale are given in Table I of my paper in J. Chem. Phys. 17, 923 (1949). The vapor pressure obtained by the three investigators are listed in Table I and the agreement is excellent, so that you have here data which appear to be of unquestioned accuracy for your purpose!" In my recent publications it transpired quite clearly.

All the same some journals refuse my papers and say that they will not recognize the kinks, because the testimony of one author is not sufficient to convince them. They will believe only if an author with great authority will repeat this work.

P.T.O.

I therefore ask you whether you could do this work in your Laboratory. With facilities at your disposal you could do it easily and without much delay.

I measured temperatures with the accuracy of 0.002°C , but accuracy of ± 0.01 is quite sufficient. And even 0.1°C is good enough because it affects densities only in the fourth significant figure ± 0.0001 . And the effects I discovered are based on the third significant figure.

In these experiments it is necessary to observe that with changing the temperatures it is not sufficient to attain the thermal equilibrium. Density at a given temperature may continue to change until the thermodynamic equilibrium is reached. The lag between the two may be of different magnitude for various liquids.

I should like to hear from you whether you will be willing to do so.

With kind regards
Yours sincerely

G. Antonoff
P.S. Sometime in April I am going to Cambridge (Eng.) to lecture on this subject.

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